Fall 2010

CS 784: Programming Languages

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CS 784: Programming Languages

Syllabus

Prabhaker Mateti

Catalog Description: Programming paradigms and concepts for high level programming languages. Techniques for formal specification. 4.000 Credit hours. **Prerequisites: CS 480/680.**

(The CS 480/680 course is taught by multiple instructors. Here is a link to CS 480/680 as taught by Dr Prasad: http://www.cs.wright.edu/~tkprasad/courses/cs480/cs480.html This link is being provided so you can judge by yourself if you are ready to take CS 784. If you took the course by Dr Raymer, or others, or at another institution, there is no problem as long as you are comfortable with the material.)

Source Material

1. Friedman, Wand and Haynes: Essentials of Programming Languages. MIT Press, 2001. ISBN 0-262-06217-8 http://www.cs.indiana.edu/eopl/
2. Guttag, J.V., "Abstract Data Types and the Development of Data Structures," CACM, vol. 20, No. 6, June 1977, pp. 396-404. "guttag-cacm77.pdf"
3. M. Felleisen, R. B. Findler, M. Flatt, and S. Krishnamurthi, How to Design Programs, MIT Press, 2002. http://www.htdp.org/ Recommended Book. Read on-line.
4. Chez Scheme Download Site: http://www.scheme.com
5. T. K. Prasad (aka K. Thirunarayan), "Attribute Grammars and their Applications", In: Encyclopedia of Information Science and Technology, Second Edition, Editor: Mehdi Khosrow-Pour, Information Science Publishing, pp. 268-273, 2008. (Local copy: http://www.cs.wright.edu/~tkprasad/papers/Attribute-Grammars.pdf)

Course Content

- Scheme as a Metalanguage
- Abstract Data Types: Algebraic Specs
- Programming Paradigms
- Abstract Syntax and its Representation
- Interpreter for a Simple Language
- User-Defined Functions; Scoping
- Implementing Recursion
- Closures and Streams
- Imperative Programming
- Object-Oriented PLs
- Axiomatic Semantics
- Attribute Grammars

- APL, Perl, Erlang, Prolog, CAML, Haskell

Grading

The letter grades will be assigned using the following scale: A[90-100], B[80-90), C[70-80), D[60-70), and F[0-60). However, I reserve the right to curve.

Homework

I will recommend that you work on various problems from the book and other places. However, as this course has currently no TA support, I will neither grade the solutions nor provide solutions.

Exams

There will be two exams contributing 30 points and 40 points to the final grade. The mid term is scheduled around the sixth week, and the final during the exam week as set by the Registrar.

Assignments

The assignments contribute 30 points to the final grade. I expect to give the assignments project in four pieces worth 5+5+10+10 points respectively. The due dates for these will be announced in class.

Bonus points are awarded in recognition of good work, in addition to the max possible points. Bonus points are used not in "curving" but in possibly pushing an individual student's grade up.
